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WILLIS, RANDAL L				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/563,647

**Applicant(s)**

HOPPENBROUWERS ET AL.

**Examiner**

RANDAL WILLIS

**Art Unit**

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 January 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-9 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 06 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/5508)  
Paper No(s)/Mail Date 4/12/06  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Inventor's Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This office action is in response to application 10/563647 filed January 6<sup>th</sup> 2006.  
Claims 1-9 are currently pending and have been examined.

#### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Information Disclosure Statement***

3. The information disclosure statements (IDS) submitted on 1/6/2006 and 4/12/2007 are compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

#### ***Drawings***

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the frame memory must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

5. The drawings are objected to because no labels are used in the drawings.

Examiner requests that features referred to in the claims be accompanied by an identifying label as well as the reference numbers currently shown.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanari (7,123,220) in view of Itoh (7,053,881).

Apropos claims 1, 8 and 9, Hanari teaches:

Display device (Fig. 1) comprising a display panel (10, Fig. 1) having a plurality of display pixels (Fig. 3) with emissive display elements (16, Fig. 3); and

duty cycle control means (Switch control signal and transistor 19, Fig. 3) for varying a fraction of a frame period during which said display pixels emit light (Fig. 4 shows different fractions of emission periods)

However, Hanari fails to explicitly teach:

The duty cycle control means controlling in dependence on an overall brightness level of an image to be displayed on said display panel.

In the same field of flat panel displays, Itoh teaches a method of improving the contrast by detecting the average brightness and peak brightness of the display (15 and 16, Fig. 1) and based upon that detection changing the amount of light emitted by the display (Backlight control portion 13, backlights are commonly controlled with a Pulse-width modulation scheme, Col 8 lines 54-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of detecting the overall brightness of the image and changing the luminance of the display as taught by Itoh in the display device of Hanari in order to improve the contrast of the display (Col 3 lines 60-65). Itoh's teaching of manipulation the backlight to change the luminance of the display does so without interfering with the gradation value of the pixels, and thus is easily adapted into the luminance duty cycle of Hanari which also doesn't effect the gradation value of the pixels so that the same effect can be achieved whether the pulse-width modulation is occurring in a backlight or on the pixels themselves.

Apropos claim 2, Itoh further teaches:

Display device (3) according to claim 1, wherein said control means (7) are adapted to increase said fraction if a decrease of said overall brightness level is determined (Col 8 lines 54-65 and Col 16 lines 43-50).

Apropos claim 3, Itoh further teaches:

Display device (3) according to claim 1 wherein said control means (7) are adapted to decrease said fraction if an increase of said overall brightness level is determined (Col 8 lines 54-65 and Col 16 lines 43-50).

Apropos claim 4, Hanari and Itoh fail to explicitly teach:

Display device (3) according to claim 1, further comprising a frame memory for storing input signals, representing said image, during a frame period for enabling a determination of the overall brightness level of the image during the frame period .

However, Examiner takes official notice that the use of frame memories in the signal processing of flat panel displays is well known in the art. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a frame memory to the display of Hanari and Itoh to allow the calculations of average brightness peak brightness and luminance control to be carried out during a previous frame's display time so as not to slow down the displaying of images.

Apropos claim 5, Hanari and Itoh fail to explicitly teach:

Display device (3) according to claim 1, wherein the control means (7) are adapted to determine the fraction of the frame period in dependence on the overall brightness level of the image during a previous frame period.

However, Examiner takes official notice that the use of frame memories in the signal processing of flat panel displays is well known in the art. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a frame

memory to the display of Hanari and Itoh to allow the calculations of average brightness peak brightness and luminance control to be carried out during a previous frame's display time so as not to slow down the displaying of images.

Apropos claim 6, Itoh teaches:

Display device (3) according to claim 1, wherein the control means (7) further comprise a look-up table (Fig. 3 shows screen brightness based upon overall brightness, which in the combine device, the screen brightness figures would be controlled by the duty cycle) for determining said fraction corresponding with said determined overall brightness level.

Apropos claim 7, Hanari teaches:

Display device according to claim 1, wherein said display pixels comprise a switch (19, Fig. 3) coupled to said control means (Switch control SC, Fig. 3) for enabling light emission by said corresponding emissive display element (Fig. 4) for said fraction of said frame period.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.



7. Claims 1-4, 6, 8 and 9 rejected under 35 U.S.C. 102(b) as being anticipated by Levac (5,451,979).

Apropos claims 1, 8 and 9, Levac teaches:

Display device (10, Fig. 1) comprising a display panel having a plurality of display pixels (matrix of LEDs, abstract) with emissive display elements; and

duty cycle control means (21, Fig. 1) for varying a fraction of a frame period during which said display pixels emit light (Fig. 2a and 2b) in dependence on an overall brightness level of an image to be displayed on said display panel (duty cycle determine by number of pixels that are illuminated, which is an overall brightness).

Apropos claim 2, Levac teaches:

Display device (3) according to claim 1, wherein said control means (7) are adapted to increase said fraction if a decrease of said overall brightness level is determined (See Fig. 4, while display is over 50% activated, the duty cycle increases as the number of energized LED's decrease).

Apropos claim 3, Levac further teaches:

Display device (3) according to claim 1 wherein said control means (7) are adapted to decrease said fraction if an increase of said overall brightness level is determined

(See Fig. 4, while display is over 50% activated, the duty cycle decreases as the number of energized LED's increase).

Apropos claim 4, Levac teaches:

Display device (3) according to claim 1, further comprising a frame memory for storing input signals, representing said image, during a frame period for enabling a determination of the overall brightness level of the image during the frame period (Fig. 3 shows display counting number of pixels to be energized in step 52, before data is clocked into the display driver, therefore inherently has a memory).

Apropos claim 6, Levac teaches:

Display device (3) according to claim 1, wherein the control means (7) further comprise a look-up table (Duty cycle table 21, Fig. 1) for determining said fraction corresponding with said determined overall brightness level.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RANDAL WILLIS whose telephone number is (571)270-1461. The examiner can normally be reached on Monday to Thursday, 8am to 5pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on 571-272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RLW

/Amr Awad/  
Supervisory Patent Examiner, Art Unit 2629